

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application. Applicant has submitted a new complete claim set showing any marked up claims with insertions indicated by underlining and deletions indicated by strikeouts and/or double bracketing.

Listing of Claims:

1. (currently amended) A method to transform a non self-describing segments of a transport-level protocol into a into self-describing segments for transporting an upper layer protocol transfer, where the transport-level protocol is layered above a network-level protocol, and where each segment comprises a standard transport header and a body separate from and following the standard transport header, the method comprising the steps of:

aligning a framing headers with the non self-describing segments by putting a framing header in the body of each segment that carries corresponding data for the upper layer protocol transfer; and

putting segment description information in the each framing header, the segment description information indicating a remote direct memory location for the corresponding data of the upper layer protocol transfer that is being carried by the segment.

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2. (original) The method of claim 1 further comprising the step of limiting an upper layer protocol data unit size to the smaller of a maximum transport segment size and a size that will fit within the non self-describing segment.
3. (currently amended) The method of claim 2 wherein the non self-describing segments are being sent on a connection to a destination address, the method including the step of terminating the connection if the upper layer protocol data unit is greater than the smaller of a maximum transport segment size and the size that will fit within the non self describing segments.
4. (currently amended) The method of claim 1 further comprising the step of putting a destination buffer id and offset in the non self-describing segments.
5. (currently amended) The method of claim 1 further comprising the step of putting a destination buffer id and a destination address in the non self-describing segments.
6. (currently amended) A computer-readable medium having computer executable instructions for performing one or more steps to transform a non self-describing segments of a transport protocol to self-describing segments for transporting an upper layer protocol (ULP) protocol data units (PDUs), where the transport-level protocol is layered above a network-level protocol, and where the segments each comprise a standard transport header and a separate body following the standard transport header, the one or more steps comprising:

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aligning the upper layer protocol with the transport protocol by ensuring that the body of each segment that transports data for the upper layer protocol is provided with one or more corresponding integral ULP PDUs that each has a respective header comprising obtaining segment description information indicating a remote direct memory location for corresponding data of the ULP; and
putting the segment description information in one of a header aligned with a header of the non self-describing segment and the header of the non self-describing segment.

7. (currently amended) The computer-readable medium of claim 6 wherein the segment description information includes a data size of data in the a non self-describing segment, the computer-readable medium having further computer-executable instructions for performing the a step of generating an error message if the data size exceeds the smaller of a maximum transport segment size and a size that will fit within the non self-describing segment.
8. (currently amended) The computer-readable medium of claim 6 having further computer executable instructions for performing the a step of putting zero-copy information in the a non self-describing segment.
9. (currently amended) The computer-readable medium of claim 6 having further computer executable instructions for performing the a step of putting a destination buffer id and a destination address in the a non self-describing segment.

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10. (currently amended) The computer-readable medium of claim 6 having further computer executable instructions for performing the-a step of putting a destination buffer id and a data size and offset in the-a non self-describing segment.

11. (currently amended) A method to transform a-non-self-describing segments of a transport protocol to-a self-describing segments for transporting an-upper layer protocol (ULP) protocol data units (PDUs), where the transport-level protocol is layered above a network-level protocol, and where the segments each comprise a standard transport header and a body separate from and following the standard transport header, the method comprising the steps-step of:

ensuring that the body of each segment that transports data for the upper layer protocol is provided with one or more corresponding integral ULP PDUs that each has a header comprising obtaining-segment description information indicating a remote direct memory location for corresponding data of the upper layer protocol.;

putting the segment description information in a header aligned with a header of the non-self-describing segment or the header of the non-self-describing segment.

12. (currently amended) The method of claim 11 wherein the segment description information includes a data size of data in the-a non self-describing segment, the method including the-a step of fragmenting the data into self-describing segments if the data size exceeds the smaller of a maximum transport segment size and a size that will fit within the-a non-self describing segment.

13. (currently amended) The method of claim 11 further comprising the-a step of putting zero-copy information in the-a non self-describing segment.

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14. (currently amended) The method of claim 11 wherein the step of putting segment description information in the header includes the step of putting a destination buffer id and a destination address in the header.

15. (currently amended) The method of claim 11 wherein the step of putting segment description information in the header includes the step of putting the a data size and an offset in the non self-describing segment.

16. (currently amended) A method of sending data via a network between an upper layer sender and an upper layer receiver through a transport having that implements a transport-level protocol and that sends data in at least one transport segments, where the transport-level protocol is layered above a network-level protocol and below the upper layer sender and upper layer receiver, and where each segment comprises a standard transport header and a body separate from and following the standard transport header the method comprising the steps of:
determining if the at least one transport segments is a are non self-describing segments, and when ; if the at least one a transport segment is determined to be a non self-describing transport segment;
obtaining segment description information indicating a remote direct memory location for upper layer data framed by a framing header;
aligning a the framing header with the at least one transport segment by ensuring that the framing header and all of the upper layer data framed thereby are put in the body of the same transport segment;
putting the segment description information in the framing header; and

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putting the data into the at least one transport segment; and
sending the at least one transport segment to the upper layer receiver.

17. (currently amended) The method of claim 16 wherein the transport segments have a transport segment size and wherein the step of putting the data into the at least one transport segment the method includes fragmenting the data into self-describing transport segments if a size of the data is larger than the transport segment size.

18. (currently amended) The method of claim 16 wherein the data comprises at least one upper layer protocol data unit and wherein the step of putting the data into a transport segment the method further comprises the step of putting ensuring that only an integral number of upper layer protocol data units are put into the the a-transport segment.

19. (currently amended) The method of claim 16 further comprising the a step of generating an error message if the data is larger than the smaller of a maximum transport segment size and a size that will fit within the transport segment.

20. (currently amended) A network interface card comprising:

memory buffers for receiving transport segments of a transport-level protocol that is layered above a network-level protocol, where each segment comprises a standard transport header and a body separate from and following the standard transport header; and

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a processing unit in communication with the memory buffers, the processing unit comprising a first module for detecting if-a-if transport segments of the e-a transport-level protocol segment is a-are non self-describing segment; and

a second module for obtaining segment description information and putting the segment description information in one-of-a header aligned with a transport segment detected to be a non self describing segment, where the header is put in the body of the transport segment, where all data corresponding to the header is ensured to be encapsulated in the body of the transport segment, and where the segment description information indicates a remote direct memory location of that data header and the non self-describing segment header.

21. (original) The network interface card of claim 20 wherein the processing unit aligns the header with the non self-describing segment header.

22. (original) The network interface card of claim 20 wherein the processing unit limits an upper layer protocol data size to the smaller of a maximum transport segment size and a size that will fit within the non self-describing segment.

23. (original) The network interface card of claim 20 wherein the transport segments have a transport segment size and wherein the processing unit fragments data into a plurality of transport segments if a size of the data is larger than the transport segment size.

24. (currently amended) A network interface card comprising:

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memory buffers for receiving transport segments of a transport-level protocol
that is layered above a network-level protocol, where each segment comprises a
standard transport header and a body separate from and following the standard
transport header; and

a processing unit in communication with the memory buffers, the processing unit performing the steps of:

detecting if a transport segment of a transport-level protocol is
a non self describing segment; and

if the a transport segment is detected to be a non self-describing
segment:

obtaining segment description information; and

putting the segment description information in one of a header
aligned with a non self describing the transport segment, where the header is put in the
body of the transport segment, where all data corresponding to the header is ensured to
be encapsulated in the body of the transport segment, and where the segment
description information indicates a remote direct memory location of that data header
and the non self describing segment header.

25. (original) The network interface card of claim 24 wherein the processing unit aligns the header with the non self-describing segment header.

26. (original) The network interface card of claim 24 wherein the processing unit limits an upper layer protocol data size to the smaller of a maximum transport segment size and a size that will fit within the non self-describing segment.

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27. (original) The network interface card of claim 24 wherein the transport segments have a transport segment size and wherein the processing unit fragments data into a plurality of transport segments if a size of the data is larger than the transport segment size.

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